

CLAIMS

Sub A7

- 5 1. A pumped fiber laser comprising a monomode laser oscillator (2) transmitting a monomode laser beam to the first end (1.1) of a doped fiber (1), characterized in that the doped fiber (1) is multimode and in that it also includes a spatial mode conversion device (3) receiving the beam.
- 10 2. The laser as claimed in claim 1, characterized in that the core of the multimode fiber (1) has a diameter very much greater than 30 micrometers.
- 15 3. The laser as claimed in claim 1, characterized in that the mode conversion device is a holographic device.
- 20 4. The laser as claimed in claim 3, characterized in that it includes a phase conjugation reflection device (5) coupled to the second end (1.2) of the multimode doped fiber (1) so as to reflect a laser beam transmitted by this fiber onto this same fiber, said reflected beam taking the place of a pump beam.
- 25 5. The laser as claimed in claim 3, characterized in that it includes one or more pumping light sources transmitting one or more pumped beams to the multimode doped fiber.
- 30 6. The laser as claimed in claim 5, characterized in that it includes an optical splitter (4) placed between the laser oscillator (2) and the first end (1.1) of the multimode doped fiber (1) in order to transmit part of the beam, emitted by the laser oscillator, toward the multimode doped fiber and another part toward the mode conversion device and in that the second end (1.2) of the multimode doped fiber is coupled to the mode conversion
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device so that the beam transmitted by this second end interferes in the mode conversion device with that part of the beam coming from the optical splitter (4) and so that energy transfer takes place from the beam transmitted by the second end of the multimode doped fiber into that part of the beam which is transmitted by the splitter, and the mode conversion device transmits a monomode amplified beam.

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7. The laser as claimed in claim 5, characterized in that the second end (1.2) of the multimode doped fiber (1) is coupled to the mode conversion device (3) and in that this mode conversion device is prerecorded so that the beam transmitted by the second end (1.2) of the multimode doped fiber is converted into a monomode beam.

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8. The laser as claimed in claim 1, characterized in that said multimode doped fiber comprises several doped cores.

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9. A pumped-fiber laser contained in an optical cavity (9, 10), characterized in that it comprises, in series with the optical cavity, a spatial mode conversion device.

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10. The laser as claimed in claim 9, characterized in that the core of the multimode fiber (1) has a diameter very much greater than 30 micrometers.

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11. The laser as claimed in claim 9, characterized in that the mode conversion device is a holographic device.